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Nº 14355

## SECULAR SLIP, REGIONAL CO-SEISMIC EFFECTS & POST-SEISMIC DEFORMATION FROM THE JUNE 28, 1992 LANDERS EARTHQUAKE: MOJAVE DESERT GPS RESULTS

MILLER, M. Meghan, Department of Geology, Central Washington University, Ellensburg, Washington 98926; WEBB, Frank H., TOWNSEND, David, GOLOMBEK, Matthew P., Jet Propulsion Laboratory, California Institute of Technology, 4800 Oak Grove Drive, Pasadena, CA 91109; Roy K. DOKKA, Department of Geology, Louisiana State University, Baton Rouge, LA

During May, 1991, a regional Global Positioning System (GPS) network was installed to monitor far field slip rates of faults within the Eastern California shear zone in the Mojave Desert and northward in the Owens Valley and Death Valley regions. The 1992 Landers earthquake sequence and its aftershocks delineate an active portion of the Eastern California shear zone and its northward extension east of the Sierra Nevada block. The surface rupture lies within the Mojave Desert, providing a unique opportunity to characterize far-field deformation with a regional GPS network that was previously occupied in May 1991, with sub-centimeter uncertainties on interstation baseline vectors. Changes in baseline length and absolute displacement vectors on the decimeter and centimeter level were determined for individual sites, characterizing regional deformation associated with the Landers earthquake sequence. Stations within 20 km of the rupture underwent absolute displacement of 25 cm; cumulative deformation across the Mojave Desert totaled several centimeters.

Measured displacements result from secular strain across the Mojave Desert which is negligible relative to the seismic effects, co-seismic elastic response, and post-seismic deformation during the six weeks between the earthquake and the second GPS experiment. These effects are considered separately, and the co-seismic signal is then compared to predictions of an elastic half space model. The GPS-determined far field co-seismic deformation have not been fit by elastic half-space models, offering new constraints on the role of crustal heterogeneity and viscous deformation in the earthquake cycle and regional scale heterogeneity in crustal structure.

The Mojave Desert sites were reoccupied in March, 1993; the entire regional network will be reoccupied during August of 1993. These experiments will provide new constraints on long term post-seismic deformation within the Mojave Desert and on cumulative slip across the northern part of the Eastern California shear zone from May 1991 to August 1993.

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